

FEASIBILITY STUDY

US 221

From US 421 to US 221 Bypass south of West Jefferson
Watauga and Ashe Counties

R-2915

Prepared by
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I. GENERAL DESCRIPTION

This preliminary study describes the proposed widening of US 221, from US 421 in Watauga County to US 221 Bypass south of West Jefferson in Ashe County, a distance of approximately 12.6 miles. Please see Figure 1 for the project location. The recommended typical section is a four-lane roadway divided by a 30-foot median. Also, it is proposed to replace Bridge number 10 with new dual structures each 30 feet wide, and construct a new 30 foot wide bridge adjacent and parallel to bridge number 4.

Additional right of way will be required to provide a total right of way width of approximately 350 feet with partial control of access. Approximately 37 residences and 17 businesses will likely be relocated due to this project.

The total project cost including right of way, utility adjustments, and construction is estimated to be \$ 32,600,000.

This study is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the problem, recommend and describe a treatment including costs, and identify potential problems that may require consideration in the planning and design phases.

This project has been included in the August, 1993 Transportation Improvement Program as an "Identified Future Need."

II. NEED FOR PROJECT

The purpose of this project is to provide a safer and more efficient route between Boone and West Jefferson. US 221 is classified as a major collector on the Statewide Functional Classification System and is generally a two-lane, 20 to 24-foot wide roadway with 5 to 12-foot wide usable shoulders. At some locations there are paved shoulders that vary in width from 2 to 4 feet. The existing right of way is believed to vary in width from approximately 100 to 350 feet. There is partial control of access. Land use along US 221 is predominantly agricultural and low density rural residential. The terrain is primarily mountainous with some relatively level stretches near both project terminals.

The south terminal of the project is located at the intersection of US 421 and US 221. This intersection is controlled with a stop sign on US 221. US 421 is a two-lane, 22-foot roadway with 1-foot usable shoulders. US 421, at this location, is now being widened to a 4-lane divided facility under project R-529. Land use there is undeveloped and low density commercial.

The north terminal of the project is located at the signalized intersection of US 221 Bypass, NC 163, NC 194, and US 221. At this intersection, both the north and south legs of US 221 have been widened to provide one thru lane, one left turn lane, one right turn lane, and one lane exiting the intersection. Land use in the vicinity of this intersection is rural undeveloped.

Bridge number 4 carries US 221 over the South Fork of New River approximately 3.0 miles north of the Ashe/Watauga county line. This bridge, is approximately 132 feet long, has a sufficiency rating of 29.7 and is scheduled for replacement, with a 30 foot wide structure, in November, 1993. It is recommended that a new 30 foot wide bridge be constructed adjacent and parallel to Bridge number 4.

Bridge number 10 carries US 221 over the South Fork New River, approximately 4.3 miles south of the intersection of NC 194 and US 221. The sufficiency rating of this bridge is 54.5 out of 100.0. This bridge is 230 feet long with a deck width of approximately 31 feet. It is recommended that this bridge be replaced with dual, 30 foot wide structures.

Estimated 1993 Average Daily Traffic (ADT) ranges from 4,100 to 6,200 vehicles per day (vpd). In 2013 the anticipated traffic is estimated to range from 7,300 to 11,000. Existing US 221 will operate at level of service (LOS) E in 1993, and a LOS E in 2013. With the recommended improvements, US 221 is anticipated to operate at a LOS A through the year 2013.

During the period from July 1, 1989, through June 30, 1992, a total of 111 accidents (including one fatality) were reported along the existing US 221. This resulted in an accident rate of 129.8 accidents per 100 million vehicle miles of travel, compared to a statewide average of 167.0 for similar routes. Trucks accounted for 23% of the vehicles involved in accidents during the study period. The recommended improvements are expected to reduce the accident rate.

III. RECOMMENDATIONS

It is recommended to widen US 221, from US 421 in Watauga County to US 221 Bypass south of West Jefferson in Ashe County, a distance of approximately 12.6 miles. Please see Figure 1 for the project location.

The recommended typical cross-section for US 221 is a four-lane roadway divided by a 30-foot median with two 12-foot wide lanes in each direction, 8-foot wide usable outside shoulders (4-foot full depth paved shoulders), and 2-foot wide full depth paved median shoulders.

It is also recommended to replace Bridge number 10 with new dual structures each 30 feet wide; and construct a new bridge, 30 feet wide, adjacent and parallel to bridge number 4.

At the southern project terminal, US 221 forms a "Tee" type intersection with US 421. US 421 is a two-lane, 22-foot roadway with 1-foot usable shoulders and is now being widened to a 4-lane divided facility under project R-529. It is recommended that the specific intersection treatment at this terminal be developed in the design phase.

At the northern project terminal US 221 intersects NC 163 and US 221 Business. Each leg of this intersection provides a three-lane approach. The north and south legs each have one lane for traffic exiting the intersection and the east and west legs each have two lanes for traffic exiting the intersection. The north and south legs of US 221 are each approximately 55 feet wide from edge of pavement to edge of pavement; each provides three approach lanes, and one lane for traffic exiting the intersection. The east and west legs are each approximately 64 feet wide from face to face of curbs; each provides three approach lanes, and two lanes for traffic exiting the intersection. It is recommended that the specific details of the US 221 cross-section transition and/or intersection details be developed in the design phase.

Additional right of way will be required to provide a total right of way width of approximately 350 feet with partial (one or more access points per property) control of access. Approximately 37 residences and 17 businesses will likely be relocated due to this project.

The total project cost including right of way, utility adjustments, and construction is estimated to be \$ 32,600,000 as follows:

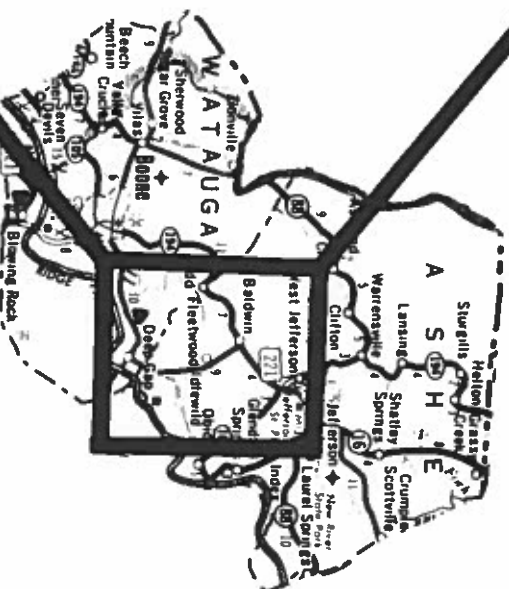
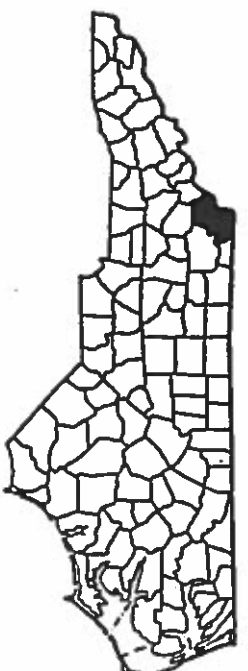
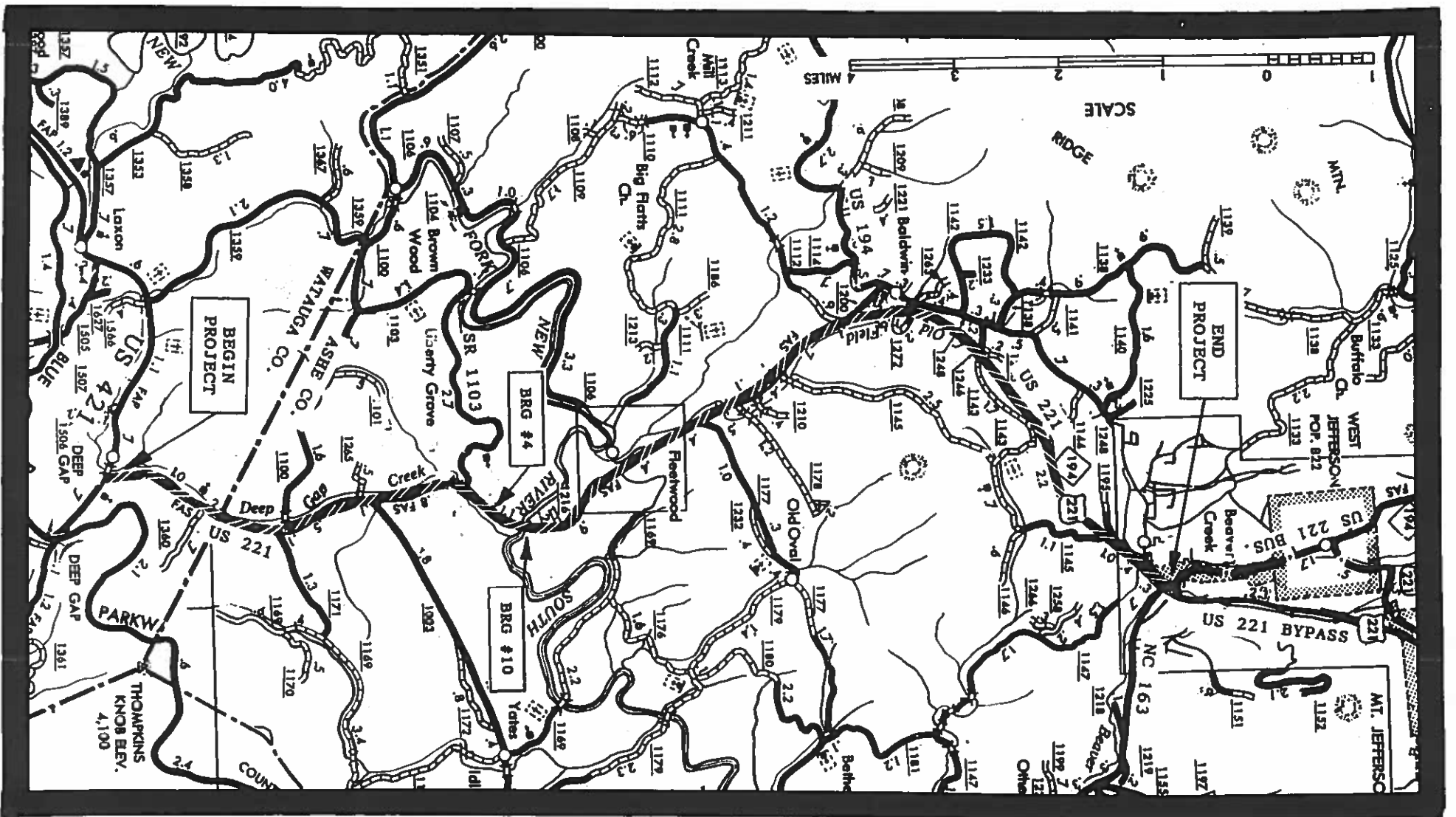
Right-of-way	\$ 9,000,000
Construction	\$ 23,600.000
Total Project Cost	\$ 32,600,000

IV. OTHER COMMENTS

This project may require a Section 10, Corps of Engineers Nationwide Permit, because it crosses the South Fork New River. Deep Gap Creek is a trout stream.

This project bisects a potential high quality water zone and a water supply watershed. Coordination with the Tennessee Valley Authority will be required since this project is in a TVA county. No historical or architecturally significant sites are known to be in the vicinity of the proposed project, however a detailed environmental screening was not conducted for this study.

The recommendation for a 30 foot wide median rather than the standard 46 foot wide median was made in consideration of the mountainous terrain and in an effort to minimize right of way and construction cost.



FEASIBILITY STUDIES UNIT

FIGURE 1. PROJECT LOCATION

US 221 FROM US 421
TO US 221 BYPASS SOUTH OF WEST JEFFERSON

ASHE & WATAUGA COUNTIES

R-2915 DIV. 11 FIGURE 1

